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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/502,391	07/26/2004	Jong Wook Seo	1751-361	3468

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ROTHWELL, FIGG, ERNST & MANBECK, P.C.
1425 K STREET, N.W.
SUITE 800
WASHINGTON, DC 20005

EXAMINER

MOON, SEOKYUN

ART UNIT	PAPER NUMBER
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2629

SHORTENED STATUTORY PERIOD OF RESPONSE	NOTIFICATION DATE	DELIVERY MODE
3 MONTHS	12/28/2006	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Notice of this Office communication was sent electronically on the above-indicated "Notification Date" and has a shortened statutory period for reply of 3 MONTHS from 12/28/2006.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PTO-PAT-Email@rfem.com

Office Action Summary	Application No.	Applicant(s)	
	10/502,391	SEO ET AL.	
	Examiner	Art Unit	
	Seokyun Moon	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 October 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 3-11, and 13-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3-11 and 13-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 July 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. The Applicants' arguments with respect to **claims 1-19** have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. **Claim 17** is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The claim discloses that the amount of the current flowing through the light emitting device to be determined by a potential difference between the high-level voltage of the data signal applied to the first pole of the diode in the first interval and the low-level voltage of the control signal. However, Examiner submits that the operation method disclosed in the claim wouldn't work in the structure of the display disclosed in claim 15 on which the claim 17 depends. Specifically, claim 15 discloses that the low-level voltage of the control signal is applied in the second interval rather than the first interval.

As best understood by the Examiner, the aspect of the invention disclosed in the claim will be interpreted as "... wherein the light emitting device emits light at the second interval, and the amount of current flowing through the light emitting device is determined by a potential

difference between the low-level voltage of the data signal applied to the first pole of the diode in the first interval and the high-level voltage of the control signal, capacitance of the capacitor, and the length of the second interval" for further examination purpose.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. **Claim 1, 3-7, 11, 13-18, and 21** is rejected under 35 U.S.C. 102(e) as being anticipated by Rutherford (US 6,861,810).

As to **claim 1**, Rutherford [fig. 2] teaches a circuit for driving a light emitting device ("*organic light emitting diode 2*") having a first pole (the anode of the "*diode 2*") and a second pole (the cathode of the "*diode 2*") opposite to the first pole, the circuit comprising:

a diode ("*rectification diode 3*") including a first pole (the anode of the "*diode 3*") to which a predetermined data signal (image signals transmitted through the "*column electrode 47*") is applied, and a second pole (the cathode of the "*diode 3*") opposite to the first pole and is connected to the first pole of the light emitting device ("*organic light emitting diode 2*"); and

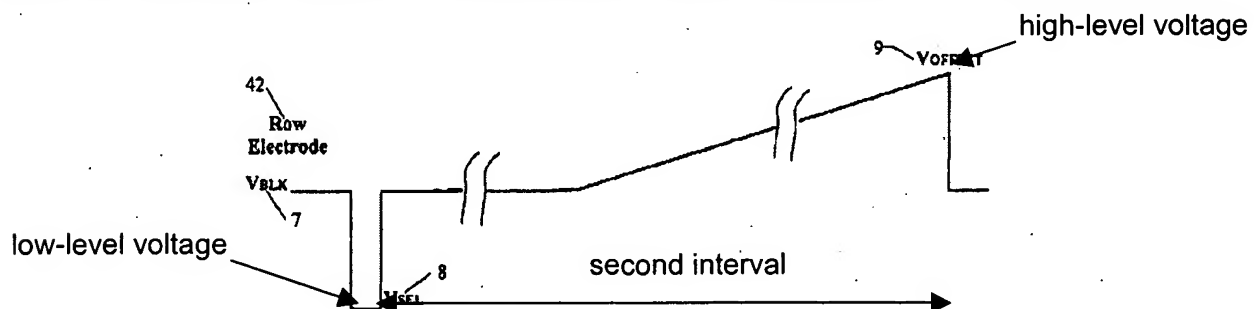
a capacitor ("*memory capacitor 4*") including a first terminal connected to a contact point between the first pole of the light emitting device and the second pole of the diode, and a second terminal to which a predetermined control signal (row selecting pulses transmitted through the "*row select electrodes 42*") is applied,

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wherein, when the diode is turned on and the light emitting device is turned off, an electric charge corresponding to a difference between a voltage level of the control signal and a voltage level of the data signal is charged into the capacitor [col. 3 lines 8-11 and 18-22], and, when the diode is turned off and the light emitting diode is turned on after the electric charge has been charged into the capacitor, the electric charge is discharged through the light emitting device [col. 3 lines 22-28],

wherein the first pole of the diode and the first pole of the light emitting device are anodes, and the second pole of the diode and the second pole of the light emitting device are cathodes, and

wherein one cycle of the control signal includes a first interval and a second interval, the first interval having a predetermined low-level voltage and the second interval having a high-level voltage obtained by jumping the voltage in the first interval by a predetermined voltage [drawing 1 provided on page 4 of this Office Action, which is equivalent to Rutherford's fig. 3].



Drawing 1

As to **claim 3**, Rutherford teaches the voltage in the second interval to be increased by a predetermined rate (the slope of the increasing linear function of the voltage included in the second interval) [drawing 1].

As to **claim 4**, Rutherford teaches that the light emitting device emits light in the second interval [col. 4 lines 24-33], and the amount of current flowing through the light emitting device is

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determined by a potential difference between the high-level voltage of the data signal applied to the first pole of the diode in the first interval and the low-level voltage of the control signal (as discussed with respect to the rejection of claim 1, the amount of charge cumulated across the capacitor depends on the potential difference between the voltage level of the data signal and the voltage level of the control signal), capacitance of the capacitor (by a well known formula $Q = C \times V$), and the length of the second interval (as shown in Drawing 1, the length of the second interval is proportional to the amount of the discharging, which is proportional to the amount of the current flowing through the light emitting device).

As to **claim 5**, all of the claim limitations have already been discussed with respect to the rejection of claim 1 except for the first poles of the diode and the light emitting device being cathodes and the second poles of the diode and the light emitting device being anodes and the first interval of the control signal to have a high-level voltage and the second interval of the control signal to have a low-level voltage.

Rutherford teaches that the first pole of the diode and the first pole of the light emitting device are cathodes and the second pole of the diode and the second pole of the light emitting device are anodes [fig. 4a].

Rutherford further teaches that one cycle of the control signal includes a first interval and a second interval, the first interval having a predetermined high-level voltage and the second interval having a low-level voltage obtained by jumping the voltage in the first interval by a predetermined voltage [fig. 4c].

As to **claim 6**, Rutherford teaches the voltage in the second interval being decreased by a predetermined rate [fig. 4c].

As to **claim 7**, all of the claim limitations have already been discussed with respect to the rejection of claim 4 except for the amount of current flowing through the light emitting device to

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be determined by a potential difference between the low-level voltage of the data signal and the high-level voltage of the control signal.

Rutherford [figs. 4a-4c] teaches the amount of the current flowing through the light emitting device to be determined by a potential difference between the low-level voltage of the data signal applied to the first pole of the diode in the first interval and the high-level voltage of the control signal [col. 4 lines 34-58].

As to **claim 11**, all of the claim limitations have already been discussed with respect to the rejection of claim 1 except for a matrix-type display panel and a control signal having a predetermined phase delay.

Rutherford teaches a matrix-type display panel [fig. 2] in which scanning lines ("*row electrodes 42*") and signal lines ("*column electrodes 47*") are arranged in a matrix-shape on a substrate, including at least one cell in the vicinity of a cross point between the scanning line and the signal line, each cell comprising a light emitting device, a diode, and a capacitor.

Rutherford further teaches a control signal having predetermined phase delay being applied to a row of cells [fig. 7].

As to **claim 13**, all of the claim limitations have already been discussed with respect to the rejection of claim 3.

As to **claim 14**, all of the claim limitations have already been discussed with respect to the rejection of claim 4.

As to **claim 15**, all of the claim limitations have already been discussed with respect to the rejection of claims 5 and 11.

As to **claim 16**, all of the claim limitations have already been discussed with respect to the rejection of claim 6.

As to **claim 17**, all of the claim limitations have already been discussed with respect to the rejection of claim 7.

As to **claim 18**, Rutherford [fig. 8] teaches the cycle of the control signal applied to a row of cells to have a maximum value corresponding to a frame cycle of the display panel.

As to **claim 21**, all of the claim limitations have already been discussed with respect to the rejection of claim 18.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. **Claim 10** is rejected under 35 U.S.C. 103(a) as being unpatentable over Rutherford.

Rutherford does not teach an amplifier amplifying a voltage level of the data signal.

However, Examiner takes official notice that it is well known in the art to include amplifiers in an electronic display in order to amplify the data signal or the image signal provided to the pixels included in the display.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include amplifiers in Rutherford's display in order to amplify the amplitude of the data / image signal, thus to enhance the driving ability of the display.

8. **Claims 8-9 and 20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Rutherford in view of Stiens et al. (US 6,407,732, herein after "*Stiens*").

As to **claim 8**, Rutherford [figs. 3a and 3c] teaches a driving method for a display including to turn on the diode in the first interval of the control signal such that the first pole of

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the diode is in one state selected from a state where the turn-on voltage is applied and a floating state [col. 3 lines 8-11 and 18-22].

Rutherford does not teach a switching device to be used to turn on / off the diode.

However, Stiens [fig. 6] teaches a display using switches to control the operation of the pixels, i.e. to turn on / off the pixels included in the display.

It would have been obvious to one of ordinary skill in the art at the time of the invention to specify Rutherford's display to use switches to turn on / off the pixel by turning on / off the diode, as taught by Stiens, since it is well known in the art to use switches to determine the timings of providing data voltages to pixels included in a display.

As to **claim 9**, Rutherford modified by Stiens teaches the brightness of the light emitting device to be controlled by the number of times when the light emitting device is turned on during one frame cycle (when the light emitting device is turned on, the light emitting device emits light), and the number of turns-on is set by switching signal (if the switch is on by a switching signal, the voltage is supplied to the column electrodes while when the switch is off by the switching signal, the voltage is not supplied to the column electrodes).

As to **claim 20**, all of the claim limitations have already been discussed with respect to the rejection of claims 8 and 9.

Allowable Subject Matter

9. **Claims 19 and 22** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Seokyun Moon whose telephone number is (571) 272-5552. The examiner can normally be reached on Mon - Fri (8:30 a.m. - 5:00 p.m.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amr Awad can be reached on (571) 272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

December 13, 2006

S.M.

AMR A. AWAD
SUPERVISORY PATENT EXAMINER

A handwritten signature in black ink, appearing to read "Amr A. Awad", with a large, stylized flourish extending to the right.